

GIS Update



A newsletter about NJDEP's Geographic Information System

Issue #37 Spring 1999

BEECRA uses ArcExplorer for quick & easy GIS access

We live in what has been dubbed the Information Age. The more access you have to information, the better. Often getting this information could take hours, days, weeks and months depending on what it was that you needed to know. Now, that same information can be obtained in a matter of minutes with a good PC, internet/intranet access, and a few keystrokes. The Bureau of Environmental Evaluation, Cleanup and Responsibility (BEECRA) has found that using ArcExplorer, a free GIS data viewer, has put a wealth of information at the desk of every case manager. ArcExplorer was created by ESRI and can be downloaded from their website at www.esri.com.

In the past, when a BEECRA case manager received a new case, that case manager would review various maps, make phone calls, and review paper files to get some general information about the site and the surrounding area. This information included locating adjacent industrial facilities and identifying nearby streams, rivers, Classification Exception Areas and Deed Restrictions. This process took hours, often over the course of several days, to complete; and sometimes, an important item might be missed, like the site next door being a former Superfund site. Today, the case managers in BEECRA can get most of this information right at their desks in just a fraction of the

time it previously took.

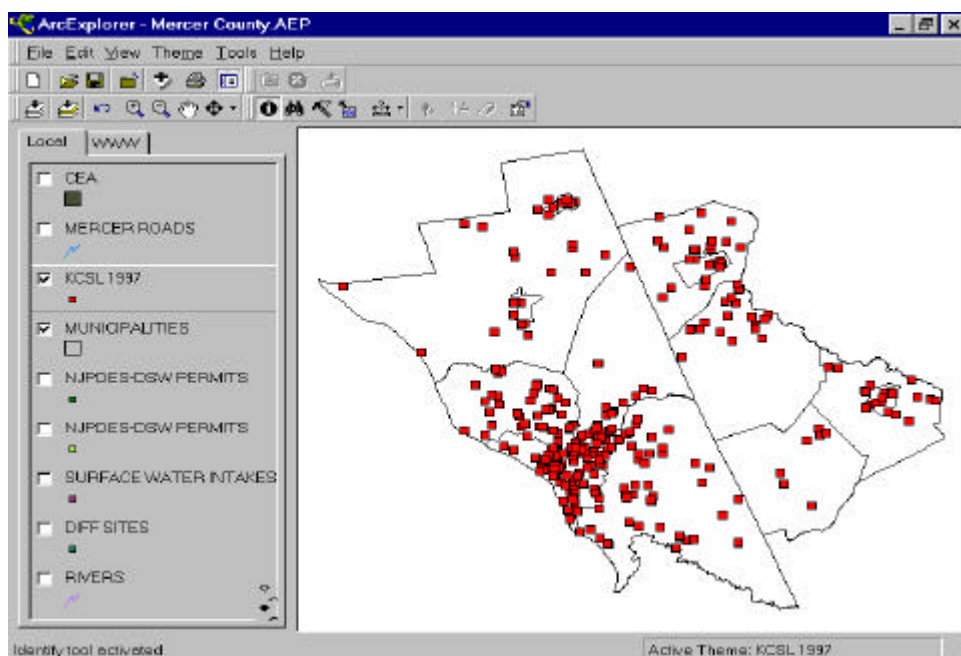
Using ArcExplorer, BEECRA has set up 21 individual "projects", one for each county in New Jersey. Each "project" is composed of about a dozen of the most commonly used coverages such as the Known Contaminated Site List (KCSL), the various NJPDES coverages, and the wetlands coverage. In addition, each project contains all photoquads which apply to that county.

The biggest problem encountered was using the query function of ArcExplorer. ArcExplorer can only query up

to 2000 records. Any query done on a coverage with greater than 2000 records does not display all relevant records. Since the KCSL coverage has over 9000 records, we used ArcView to create individual KCSL shapefiles for each county. This ensures that each shapefile has less than 2000 records.

After the projects were completed, a copy of the ArcExplorer installation program was placed on the BEECRA Intranet to allow the case managers to install the software themselves, and at their own convenience.

Continued on page 2



The Story Behind ENDEX

The Bureau of Geographic Information and Analysis recently welcomed four new staff – Marla Chassels, John Bocchino, Paul Caris and Jackie Arnold (from left to right in the photo). They will be developing and administering the Environmental Data Exchange (ENDEX) program – an “information sharing” web site.

The process of creating environmental data can be very complicated and expensive. Imagine your frustration when you realize that the spatial layers you just spent hours and money creating were available for free from another agency. The problem was that you didn't know how and where to acquire the data to avoid this duplication.

Tasked by executive order, the Federal Geographic Data Committee (FGDC) was instructed to organize and standardize how digital spatial data is collected and referenced. The FGDC has developed a standard to guide the public through the documentation of spatial data, otherwise known as metadata. Metadata contain descriptive information such as who, what, where, why, and how the data was created. The FGDC requires a specific content and format for metadata to make it compliant with their standards and searchable over the internet. Utilizing the power of the

internet, an FGDC clearinghouse node provides a forum for users to post, view and search compliant metadata as well as acquire the data set. One stop shopping through an internet Clearinghouse solves the problem of obtaining well-documented data in a timely and cost effective way. Additional information on the FGDC can be found at www.fgdc.gov.

ENDEX IS BORN

The New Jersey Department of Environmental Protection (NJDEP) recognized the benefits of having a clearinghouse for the New Jersey community. This statewide initiative has evolved into the web-based Environmental Data Exchange (ENDEX). ENDEX will contain a FGDC compliant clearinghouse node, a digital library component for related environmental information and analysis templates for data manipulation. Accurate and reliable New Jersey information will be at the fingertips of NJDEP employees and other outside organizations. Integrated data analysis, data cataloging and data sharing will be centralized for easy access to the envi-



ronmental community.

The goal of ENDEX is to demonstrate to the public and to other environmental agencies how open information access and data sharing on the internet can improve effectiveness and accelerate the transition to community-based environmental management. ENDEX will maximize geographic information technologies to help solve real world problems. We welcome all suggestions or questions you might have concerning ENDEX; email us at endex@gis.dep.state.nj.us. Additional information on ENDEX can be found on the NJDEP intranet site <http://depnet/gis/> or on the internet site <http://www.state.nj.us/dep/gis/>. Please be sure to check our site for updated information on the development of ENDEX.

Submitted by the ENDEX Team

BEECRA

(Continued from page 1)

At a couple of subsequent staff meetings, some in-house demonstrations were done and everyone was encouraged to begin using the software. Additionally, the Case Managers were asked to verify whether their individual sites were accurately located on the KCSL coverage.

Although BEECRA does have a few copies of ArcView for more specialized

GIS functions, it was found that ArcExplorer requires much less training. In addition, since ArcExplorer is free, it can be installed on an unlimited number of computers. This allows everyone in BEECRA quick and easy access to GIS data.

Overall, the use of ArcExplorer in BEECRA has been a simple, low-cost way to access GIS. It has provided a means for all 40 Case Managers to gain exposure to GIS and to increase the accuracy of the KCSL coverage. More

importantly, it has decreased the amount of time spent researching historic and current conditions of our sites and the surrounding areas.

In the future, BEECRA hopes to develop new ways to use ArcExplorer, such as for assigning cases, for researching historic fill information, and for viewing analytical data, which is submitted electronically.

Submitted by Michael Buriani and Linda Taylor, BEECRA

Issues in GIS

This issue of the NJ GIS Update introduces a new column – “Issues in GIS”. It will provide a forum through which to discuss some of the challenges faced by users and managers of GIS. We will begin by describing a problem faced by NJDEP and common to other groups of GIS users, and discuss how it was dealt with. Then we will ask you, the reader, to share your experience. Responses will be recorded in the following issue of the GIS Update. Names will be withheld upon request. This forum should allow for a useful exchange of ideas and experiences. By sharing our techniques for coping with the same issue, we all gain useful information on how a given problem can or should be handled.

Submitted by Angela Witcher of the BGIA, our first topic is...

HOW TO KEEP UP WITH THE DEMANDS OF FAST GROWING TECHNOLOGY WHEN YOU DON'T HAVE A FAST GROWING BUDGET.

Whether simply displaying geographic data or modeling a contamination plume, using the right tools can mean the difference between success and failure. Having the optimum hardware and software enhances both the variety and effectiveness of analysis tools and the efficiency with which you work. For example, the ArcView GIS software, which costs \$1200, will run with 32 MB of RAM. But GIS analysis often relies on large databases. If you need to view landuse or aerial photography you'll want the recommended 64 MB of RAM. Should you want a realistic view of a city's skyline or well depth you will want to see your data in three dimensions. The 3-D Analyst extension can be purchased for \$2500. To ensure that 3-D Analyst runs effectively double your RAM to 128 MB. And if you don't have an open GL compliant

graphics card, plan on spending another \$100 to get it. Don't forget to budget for upgrades for both core software and related modules. Some are free, but every other year or so they will cost a few hundred dollars. If you want technical support from the vendor, plan on purchasing a maintenance contract. The price varies but it could be \$600 annually for a single licensed copy of software.

As pricey as software and hardware can be, data creation can be even more. In order to provide users with photographic base maps, DEP participated in a multi-year project that encompassed everything from arranging for the fly-over of NJ, to the creation of digital products, to the distribution of the data. Total cost, \$1.2 million.

The figures can be daunting. But rather than give up the benefits of GIS technology we managed to cope with the costs in several different ways:

- 1) Allocate time for outreach. Routinely demonstrate to budget watchers and fellow staff the benefits and long term cost effectiveness of using GIS. Snazzy demonstrations at meetings, conferences and special events can be very effective. Put GIS in people's minds, show them what it can do for them and try to make it easy.
- 2) Work cooperatively with GIS professionals in other agencies to pool resources, especially for data development. Without working with USGS and New Jersey's State Mapping Advisory Committee (SMAC), large-scale projects like the development of digital photographic base maps may not have been possible.
- 3) Make bulk purchases. Another example of working cooperatively, organizing a purchase within your agency will lower individual costs considerably.
- 4) Seek out funding from other sources. Grants from outside agencies are invaluable.

- 5) Investigate trading in old hardware for new. You could save thousands of dollars.

The result has been a growth in GIS use and functionality for the department and other agencies in the state. It doesn't always happen at the rate we would like, but most of us have been able to enjoy steady improvement in our programs.

Nevertheless, even the above approaches could be insufficient for agencies with very small or inflexible budgets. Additional tactics exist if you qualify. For example...

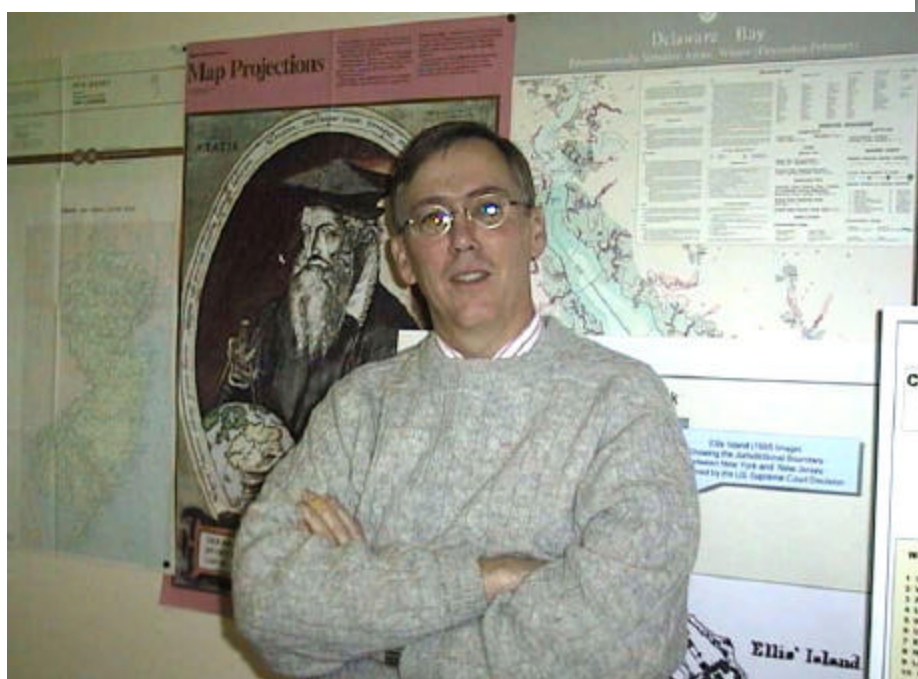
- 1) Investigate discount pricing. Software vendors may have special pricing for schools or libraries. NJDEP has even brokered an agreement whereby free software is available for qualifying non-governmental organizations.
- 2) Purchase existing data, especially through the public sector. NJDEP distributes most of its reference data for a nominal fee. Whether through the purchase of a CD or a free digital data download from our web site, users can take advantage of a wealth of information without bearing the cost of production.
- 3) Join a specialized GIS users group. NJDEP created a consortium of county health agencies that received funds from the department to incorporate GIS technology. The counties in turn share the data they create with NJDEP, allowing the department to have access to data it could not otherwise obtain. Other types of users groups could include non-profit organizations or municipalities within a single county. In any case it's a great way to learn and share resources. Most often it's data, but sometimes it includes access to hardware and software as well.

Whether a large, mid-sized, or small agency, there are a variety of approaches to take for supporting GIS.

(Continued on page 4)

Larry Thornton appointed acting manager of BGIA

Larry Thornton is now acting manager of the Bureau of Geographic Information and Analysis, Office of Information Resources Management. He has been with the GIS unit since 1987, concentrating on data development and digital imagery. Larry can be reached at (609) 633-8144 or (609) 984-2243. Larry's e-mail address is larryt@gis.dep.state.nj.us.



Issues in GIS

Continued from page 3

The above examples reflect NJDEP's experience. Now we would like to know your experience – is it the same, similar or completely different? It would be informative to know what methods people are using to ensure that GIS thrives in their organizations. Just drop a paragraph or two describing your experience to Angela Witcher of the Bureau of Geographic Information & Analysis at the NJDEP. We look forward to hearing your comments. Remember, it's your "NJ GIS Update" too. We welcome your participation in this forum.

Email: angelaw@gis.dep.state.nj.us

Mail: Angela Witcher
NJDEP-OIRM
P.O. Box 428
401 E. State St
Trenton, NJ
08625-0428

Phone: (609)633-2169



TECHNICAL CORNER



ViewFinder Extension adds pre-made views to project

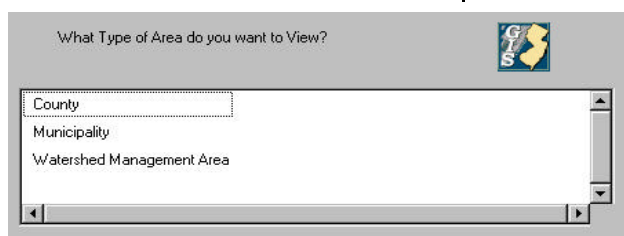


The ViewFinder extension lets the ArcView user easily add pre-made views to a project. Views by county, municipality and watershed are cur-

rently available. Developed by Bill Guthe of the BGIA, the extension is designed for in-house use as it calls on a DEP GIS directory where views are stored as odb files. The extension appears as a "glasses" icon on the project GUI.

The user is first asked to select the type of area to view – county, municipality or watershed. The next selection box allows the user to specify which municipality, county or watershed to view.

Continued on page 5



Technical Corner

Continued from page 4

Each view opens with a number of themes in the table of contents which the user can choose to delete or add to using the theme selector button. ViewFinder can be modified to include other types of areas that call pre-made views.

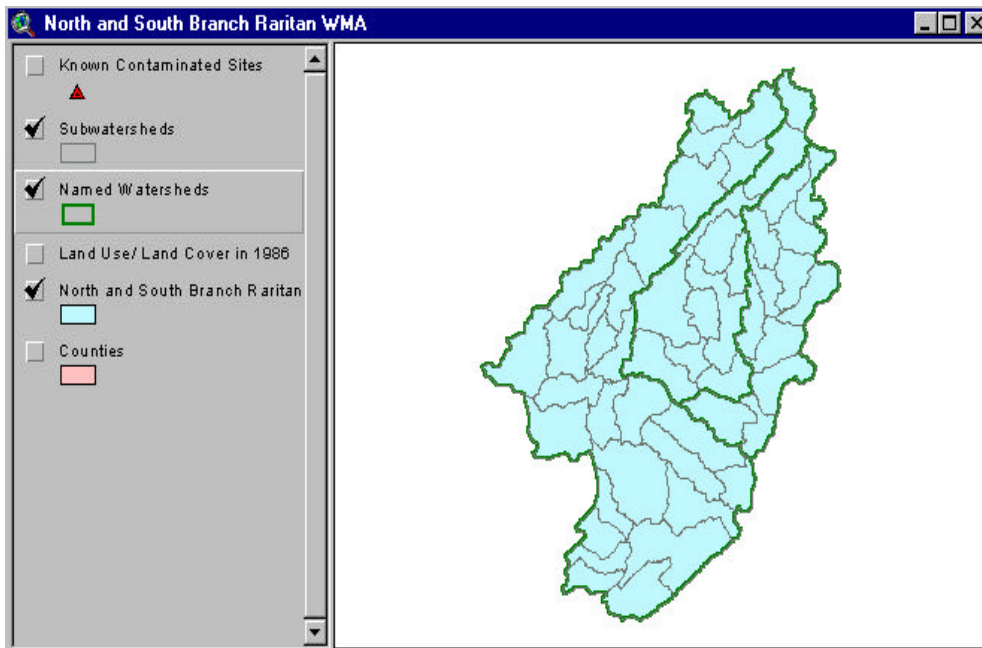
Note to PC/LAN ArcView users: Extensions are stored in the /develop/av30/ext directory on the GIS UNIX server. To access these extensions from a PC you must have the DEVELOP drive mapped and the \$USEREXT variable must be set in your PC's autoexec.bat file. Detailed instructions on setting variables and mapping drives are available on the BGIA Intranet web page at <http://depnet/gis>. Click on "GIS Resources" and go to "Setting up DEP-View on a PC."

Projector! Extension, NADCON, & Datum Handling

People using the ArcView Projector! extension should be aware that it does not support datum transformations. For example, if your data in decimal degrees was collected in NAD27 and you project to State Plane NAD83, the resulting coordinates will be incorrect. ArcView assumes that the decimal degrees data being projected is the same datum as what you are projecting to. Users at DEP have reported an average displacement error of 200 feet.

ESRI has announced that ArcView version 3.2 will include the ArcView Projection Utility which will support datum transformations and projections, as well as offering a method to easily create coordinate system metadata. DEP anticipates delivery of a beta copy of ArcView 3.2 sometime in May.

Presently this problem can be overcome by using a combination of the NADCON extension and the Projector! Extension. The NADCON extension is



A watershed view that can be selected with the ViewFinder extension.

an Avenue implementation of NOAA's NADCON program which converts coordinates from NAD27 to NAD83 and vice versa. It is available for download from the ESRI web site, www.esri.com. (Click on "free" from the main page and then "user scripts".) Upon unzipping the NADCON file after download you will find four files: nadcon.avx, nadcon.txt, conus.dbf and conus.prm. Conus.dbf and conus.prm are grid and parameters files required to run the extension. Nadcon.txt is a help file.

Two steps are required to properly convert data from decimal degrees NAD27 to State Plane NAD83:

- 1) Use NADCON to project the NAD27 decimal degrees to NAD83 decimal degrees.
- 2) Use Projector! To convert the NAD83 decimal degrees to State Plane NAD83.

A scenario where you are going from one projection system and datum (such as UTM NAD27) to another (such as State Plane NAD83) requires 3 steps:

- 1) Use Projector! to convert UTM data to decimal degrees (which will automatically default to NAD27).

- 2) Use NADCON to convert the decimal degrees NAD27 to decimal degrees NAD83.

- 3) Use Projector! To convert the decimal degrees NAD83 to State Plane NAD83.

Experienced users can use the PROJECT command in ARC/INFO as well.

AV / MO Developers Group to meet May 18

The next meeting of the Avenue/MapObjects Developers Group will be held on Tuesday, May 18 at 10:00 in the GIS Work Area, first floor, 401 E. State St.

The developers group meets every two months to share knowledge on GIS programming techniques. GIS users who need to learn more about creating customized applications or who wish to share applications are welcome to attend these meetings. Please e-mail Barbara Plunkett (barbp@gis.dep.state.nj.us) with agenda items or for more information about this forum.

Data News

All 1995/97 Digital Imagery Now Available on CDROM from DEP Maps and Publications

The final two mastered CDROMs in Series 3, Volumes 8 and 9, are now available from the NJDEP Maps and Publications (609-777-1038). These two CDROMs contain digital images from portions of Sussex, Warren, Hunterdon, Salem, Gloucester and Cumberland counties. Maps and Publications can assist in determining which CDROMs are required based on municipality, county or watershed management area. Each CD-ROM is \$30.

The first seven volumes of Series 3 have been available since October 1998. These final two CDROMs draws to a completion the NJDEP 1995/97 overflight and digital imagery production project.

The digital images are color infrared, three bands, at one meter resolution, and are stored in a .JPEG compression. Each image has been compressed to about 8mb. Each CD-ROM contains 70 images. Images are numbered according to the USGS quarter quadrangle numbering system. Each CD-ROM also contains some GIS data layers and text files to assist the user in determining how many CD-ROMs are required and which images cover what geographic area in New Jersey. The images are referenced in North American Datum 1983 and in New Jersey State Plane feet.

Unfortunately, one image was registered incorrectly on the mastered CDROMs. Image #993 (Lakehurst Southwest) on Series 3, Volume 4, needs to be replaced. The replacement image has been posted on the Web at <http://www.state.nj.us/dep/gis>. Look under "Data on CDROMs" and go to "Important message about Series 3."

Click on this and you will be linked to a self executable file which contains the image and world file. The image size is 7845kb. We apologize for the inconvenience.

Submitted by Larry Thornton, BGIA

CDs for loan at State Library

Series 1, Volumes 1, 2, and 3 (GIS Resource Data for South, Central and North New Jersey) are available for loan from the New Jersey State Library. The library address is 185 West State Street, Trenton, and the general information number is (609) 292-6220

Landuse/Landcover Update

As mentioned in previous *NJ GIS Updates*, DEP is having the 1986 land use/land cover data layer updated using the 1995/97 digital imagery. The intent of the project is to provide more current land use data, increase the detail of the land use data available, provide information on impervious cover, and allow trend analyses for the 1986-95 time period.

As such, the Anderson classification system is again being used to classify land use/land cover types. Changes include reducing the minimum polygon size from 2.5 to 1 acre, adding additional categories for some land use types, and evaluating every polygon for the amount of impervious cover. Each data set will include both the 1986 code and the 1995/97 code for every polygon, so that trend analyses can be undertaken. In addition, reflecting the emphasis on watershed based planning and analyses, the updated layers are being

produced by Watershed Management Areas (WMAs), with 20 data sets produced instead of the 21 original county based land use layers.

The DEP has received the first two land use update layers for review. These are for WMAs 6 and 19. The shape file for the layer for WMA6 are available to internal staff and can be found at: / D A T A / W A T E R S H D / HOLDING/1PASSAIC/WMA6/06lu95. SHP.

The second has been loaded at / D A T A / W A T E R S H D / HOLDING/5LODEL/WMA19/19lu95. shp. There is a text file with each that describes the attributes in each data layer. We do stress that these data sets are preliminary at this time, and will not be considered finalized until after a detailed review has been completed. However, users are encouraged to take a look at these data sets, and submit any comments to the BGIA, since your input would be helpful in the overall review process. These data sets are fairly complex, and we anticipate them undergoing some changes as the review progresses, but it is clear that the information contained in these layers will be extremely valuable for planning and environmental analyses in the future.

The entire state is scheduled to be completed by September, 2000. Next to be delivered are WMAs 3, 4 and 5 in June, 1999, followed by WMAs 12 and 13 in August. The rest of the delivery schedule will be included in the next *NJ GIS Update*. If you have any questions or comments regarding the project, email them to either Larry Thornton or John Tyrawski of the BGIA at lar-ryt@gis.state.nj.us or johnht@gis.dep.state.nj.us.

Submitted by John Tyrawski, BGIA

Receive your NJ GIS Update via E-mail



The *NJ GIS Update* can be e-mailed as a PDF file to subscribers who prefer a digital copy to paper. Adobe Acrobat Reader is required to view the PDF file and can be downloaded from <http://www.adobe.com/prodindex/acrobat/readstep.html>. The *Update* will also be posted on the BGIA web page along with two years worth of back issues. Send your e-mail address to barbp@gis.dep.state.nj.us, and please include whether you are currently receiving the *Update* or are a new subscriber.

12th Annual DEP GIS Mapping Contest scheduled for June 8th



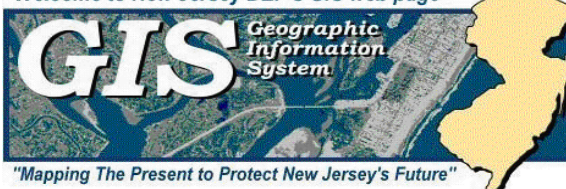
The annual DEP GIS Mapping Contest is scheduled for Tuesday, June 8th from 10:00 to 12:00 in the Public Hearing Room (first floor of the DEP Building – 401 E. State St.) The Mapping Contest is open to NJ DEP employees, members of the non-profit organiza-

tions, and county government employees. It is an opportunity to share one's work and expertise with colleagues in an enjoyable atmosphere.

All maps will be entered in one of the following categories: Best GIS Application; Best Use of GIS to Inform; Best Use of GIS Analytical Capabilities; Most Innovative Use of GIS; Black & White; and Small Format. Awards will be given for the winner in each category as well as for the following areas regardless of category: Most Attractive Map; Rookie of the Year (DEP); Best Overall Map (DEP); Best Overall Map (County); and Best Overall Map (Non-profit).

Detailed information regarding the contest is posted at the BGIA web site <http://www.state.nj.us/dep/gis/> under the Meetings & FAQs section. You can also contact contest coordinators Marla Chassels - mchassel@gis.dep.state.nj.us (609) 633-1393 and Angela Witcher - angelaw@gis.dep.state.nj.us (609) 633-2169 for information.

Welcome to New Jersey DEP's GIS web page



Visit the BGIA web page at
<http://www.state.nj.us/dep/gis/>

or

<http://depnet/gis/>
(DEP Intranet)

Recent updates

* A scroll bar on the opening page has "latest and greatest" information. Each scroll item can be clicked on to take you to more detailed information.

* Staff photos have been added to the staff bios page. Now you can put the face with the name!

New Jersey GIS Update

Issued quarterly by the

NJ Department of Environmental Protection
Office of Information Resources Management
Bureau of Geographic Information and Analysis
P.O. Box 428
401 E. State St.
Trenton, NJ 08625

Editor: Barbara Plunkett (609) 633-2641
E-mail: barbp@gis.dep.state.nj.us

— GIS Events —

1999 ESRI User Conference

July 26-30, in San Diego, California

The San Diego Convention Center will be the site for the 30th annual conference which features over 800 paper presentations, ESRI technical workshops and an expanded map gallery. Information is posted at www.esri.com/events/uc.

URISA '99 Annual Conference

August 21-25 in Chicago, Illinois

The 36th Annual Urban and Regional Information Systems Association Conference is especially geared for managers, executives and elected officials who are trying to improve our urban and regional environments through information technology. Information about the conference is posted at www.urisa.org or call (847) 824-6300.

In This Issue.....

BEECRA uses ArcExplorer.....	1
ENDEX Team Formed.....	2
Issues in GIS.....	3
Larry Thornton BGIA Manager...	4
Technical Corner.....	4
Data News.....	6
Receive Update via e-mail.....	7
12th Annual DEP Map Contest....	7
GIS Events.....	8

1999 NEARC Conference

November 7-10 in Mashantucket, Connecticut

The annual gathering of the Northeast Arc Users Group will be held at the Foxwoods Resort Casino in Northeastern Connecticut. Contact Deborah Dumin at Connecticut DEP for information. Phone: 860-424-3595 E-mail: deborah.dumin@po.state.ct.us

NJDEP
OIRM-BGIA
P.O. Box 428
401 E. State St.
Trenton, NJ 08625